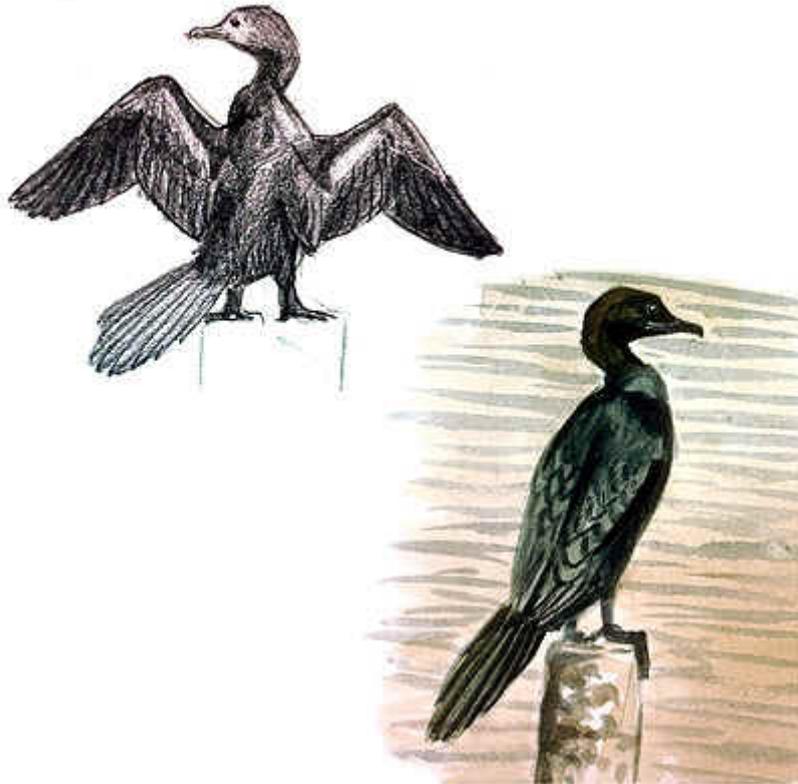


**ACTION PLAN FOR THE PYGMY CORMORANT
(*Phalacrocorax pygmeus*) IN EUROPE**



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Timetable

First draft: September 1994
Workshop: October 1994
Second draft: November 1994
This version: February 1996

Reviews

This action plan should be reviewed and updated by BirdLife International every five years. An emergency review will be undertaken if sudden major environmental changes, liable to affect the population, occur within the species' range.

Geographical scope

The action plan needs implementation in Albania, Bulgaria, Greece, former Yugoslav Republic of Macedonia, Moldova, Romania, Russian Federation, Turkey, Ukraine and Federal Republic of Yugoslavia (Serbia only).

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SUMMARY	

The Pygmy Cormorant is considered today as Near-Threatened within its whole geographical distribution, from the Federal Republic of Yugoslavia to the Russian Federation (Collar *et al.* 1994), and is listed as Vulnerable at European level (Tucker and Heath 1994). Its present world breeding population is estimated at 13,000 pairs, and probably half of this number is in Europe, where the largest colonies are still found in Romania, Turkey and Greece. Recent surveys in Azerbaijan suggest a substantial additional population there. Data on the distribution, biology and ecology of this species are dramatically inadequate.

Since the second half of the nineteenth century the Pygmy Cormorant has never stopped declining – due to drainage, persecution by fishermen, destruction of breeding colonies and degradation of wetlands.

In view of the limited knowledge available on this species, it is important to take a cautious approach and not to recommend possibly counter-productive measures.

Threats and limiting factors

- * **Drainage and habitat degradation of breeding and wintering habitats - critical**
- * **Disruption of the hydrological regime - high**
- * **Disturbance and shooting - medium**
- * **Fishing nets - unknown**
- * **Contamination with heavy metals - unknown**
- * **Climatic change - unknown**

Conservation priorities

- * **Effective legislation to protect the species and its habitat from hunting, disturbance and development - essential**
- * **Appropriate management of wintering and breeding sites, particularly vegetation, water levels and access - essential**
- * **Monitoring of wintering and breeding populations - essential**
- * **Monitoring of water levels and water quality at Pygmy Cormorant sites - essential**
- * **Development and implementation of national action plans for the species and for the conservation of wetlands - high**
- * **Research into dispersal and feeding ecology - high**
- * **Public awareness campaign aimed at hunters, fishermen, local communities, politicians and civil servants - high**

INTRODUCTION

The Pygmy Cormorant *Phalacrocorax pygmeus* was, until recently, classified by IUCN as globally threatened in the category Insufficiently Known (Groombridge 1993). According to the new criteria developed by IUCN (Mace and Stuart 1994), it has been re-classified as near-threatened (Collar *et al.* 1994). At the European level it is considered Vulnerable (Tucker and Heath 1994). It is listed on Appendix II of the Bern Convention, Annex I of the EU Wild Birds Directive, Appendix II of the Bonn Convention and in the African-Eurasian Migratory Waterbirds Agreement (AEWA) developed under the Bonn Convention.

This action plan includes c.50–60% of the species' world breeding population and <80% of its wintering population.

This action plan is a framework document which identifies the main threats and the main actions to be taken in order to enhance the population of this species and restore its habitat. It is therefore recommended that a body is designated in each country to prepare a detailed national action plan for the species; the same body will also be responsible for implementing this. The preparation of such a plan will provide an opportunity to further develop objectives involving integrated and interdisciplinary work as well as specific policies.

PART 1. BACKGROUND INFORMATION

Distribution and population

The Pygmy Cormorant is the smallest of the three European cormorants. It is restricted to the south-east of the western Palearctic but has occurred accidentally in Austria, Czech Republic, France, Germany, Hungary, Italy, Poland, Slovakia, Sweden, Switzerland and Tunisia (Cramp and Simmons 1977, Johnsgard 1993).

Today, it breeds in Albania, Bulgaria, Greece, Moldova, Romania, Russian Federation, Turkey, Ukraine and Federal Republic of Yugoslavia (in Serbia), mainly along the coast of the Caspian Sea (Cramp and Simmons 1977, Nankinov 1989, Johnsgard 1993: Table 1). It is not known whether it still breeds today in south-east Iraq and Iran. The world population is estimated to be c.13,000 pairs (Nazirides and Papageorgiou in press). Rose and Scott (1994) estimate the world population at c.30,000 individuals.

Table 1. The European breeding populations of *Phalacrocorax pygmeus* (modified from Nazirides and Papageorgiou in press).

Country	Breeding pairs (year of census)	References
Albania	100–300 (1990s)	D. Vangeluwe pers. comm.
Bulgaria	60–180 (1990s)	T. Michev pers. comm.
Fed. Rep. of Yugoslavia (Serbia only)	150 (1980s)	Grimmett and Jones 1989
Greece	557–590 (1990s)	Nazirides and Papageorgiou in press
Moldova	200–500	Tucker and Heath 1994
Romania	4,000 (1990s)	M. Marinov pers. comm.
Russian Federation	150–250	Tucker and Heath 1994
Turkey	1,000–1,500 (1990s)	Dogal Hayati Koruma Dernegi pers. comm.
Ukraine	10–30	Tucker and Heath 1994
Total	6,227–7,500	

According to Cowles (1981), the species was more widespread during the Middle Ages, including even the British Isles. It stopped breeding in the Aral Sea area in the 1970s. It is extinct in Hungary (although apparently bred again there in 1988) and was considered to be a breeding species in Algeria in the nineteenth century (Hudson 1975, Cramp and Simmons 1977). In 1940 it probably bred for the last time in Israel (S. Ashkenazi verbally 1994), but may breeding again, although nests have still not be found (S. Ashkenazi verbally 1994). It bred in Italy in 1980 (Ortali 1981), 1981 (Fasola and Barbieri 1981) and 1994, when three breeding pairs were discovered (..... Volponi verbally 1994).

Pygmy Cormorants winter mostly in the Balkans (Albania, Greece, Yugoslavia), western Turkey, Cyprus, Iraq, Iran and recently in Israel, Bulgaria and Romania. Many birds are also wintering along the Azerbaijan and Iranian coasts of the Caspian Sea.

During the 1993 midwinter counts in the Black and Mediterranean Seas, 5,240 individuals were recorded. In Asia (including the Middle East), 912 were counted (Perennou *et al.* 1994). *These numbers are obviously too low which may be because the species is difficult to count and often winters along rivers (e.g. Axios, Danube) where it can be overlooked.*

Life history

*** Breeding**

Pair-bonding activity takes place in the wintering areas (Straka 1990), and eggs are eventually laid between the end of March and early July (Cramp and Simmons 1977, Johnsgard 1993, Nazirides and Papageorgiou in press). Pygmy Cormorants breed in colonies, often with other species (cormorants, herons, Spoonbill *Platalea leucorodia*, Glossy Ibis *Plegadis falcinellus*, etc.). Nests are in dense trees or bushes on medium to high branches or in thick reedbeds 1–1.5 m above water-level (Cramp and Simmons 1977, Johnsgard 1993). At Lake Kerkini in Greece, birds nest in mixed colonies in flooded forest; nests are 2.2–5.5 m above ground (Nazirides and Papageorgiou in press). Old nests are often repaired and re-used (Cramp and Simmons 1977, Johnsgard 1993), and if nests are destroyed the birds will build anew (Nazirides and Papageorgiou in press). Clutch size is 2–8 (Cramp and Simmons 1977). Mean hatching success is 77.1% (74.0–78.7%), and the mean survival rate to three weeks old is 69.1% (68.1–69.9%) (Nazirides and Papageorgiou in press). The young fledge at 6–7 weeks old.

*** Feeding**

The diet is primarily fish, though small mammals, crustaceans, leeches and large insects are occasionally taken (Cramp and Simmons 1977, Johnsgard 1993, A. J. Crivelli and G. Catsadorakis verbally 1994). Andone *et al.* (1969) found 15 fish species in 130 birds collected in the Danube delta; these included perch *Perca fluviatilis* 18.8%, roach *Rutilus rutilus* 14.8%, carp *Cyprinus carpio* 10.8%, spined loach *Cobitis taenia* 9.7% and pike *Esox lucius* 5.6%; average weight of the fish was 15 g (7–71 g). Pygmy Cormorants feed exclusively in shallow water.

*** Habitat requirements**

Pygmy Cormorant is a species of warm climates, mainly restricted to lowland freshwater and brackish habitats. It has been recorded in: open water with sizeable trees in the proximity; fresh or brackish marshes with thick reedbeds; open water or slow-flowing fresh water, including oxbows, backwaters, ricefields, swamps and flooded fields where fish can be easily caught in shallow water; densely vegetated areas with trees, bushes and even small floating islets of dead plants.

Wintering is mainly in coastal lagoons and deltas, and along rivers in riparian forest, but also in inland wetlands (e.g. at Lakes Prespa, Kerkini and Kastoria in Greece; Ovcharitza in Bulgaria; Sultan marshes, Lakes Uluabat and Isikli in Turkey).

There is no information available on passage habitats.

Threats and limiting factors

*** Drainage and habitat degradation of breeding and wintering areas**

In most countries this is the most important factor in the decline. Drainage of wetlands and development schemes (for land reclamation and irrigation) were responsible for the abandonment of many colonies and reduced considerably the number of wetlands which can be used by Pygmy Cormorants. A decrease in the availability of shallow waters (e.g.

through drainage or water extraction) might be detrimental to breeding success or to winter survival.

Importance: critical

* **Disruption of the hydrological regime of wetlands**

Disruption of the natural pattern of water quantity, hydrology and flow distribution has a negative affect on the functioning of wetlands and on the birds which depend on them.

Importance: high

* **Contamination by heavy metals and pesticides**

The single study available (Fossi *et al.* 1984) found rather low concentrations of heavy metals and chlorinated hydrocarbons in eggs collected in the Danube delta.

Importance: unknown

* **Disturbance and shooting**

In many countries, fishermen view Pygmy Cormorants as competitors (like other species of cormorants) and destroy colonies. Winter shooting of Pygmy Cormorants is common in several areas. Disturbance by birdwatchers at the colonies, especially for photography, may cause serious problems (e.g. Lake Prespa, Lake Kerkini). Disturbance might also increase predation.

Importance: medium

* **Fishing nets**

In some areas where fishermen set their nets close to the colonies (e.g. Kerkini in Greece), Pygmy Cormorants, especially juveniles, are caught in nets and drowned. Such mortality also occurs in winter.

Importance: unknown

* **Climatic changes**

Climatic change has been an important influence on the geographical distribution of the species. During the Middle Ages, the climate in Europe reached its warmest for thousands of years, and the temperate conditions with mild winters helped Pygmy Cormorants to become established in England (Cowles 1981). The subsequent change to severe winters restricted its range.

Importance: unknown

Conservation status and recent conservation measures

* **Albania**

Legislation. Protected since 1988 by the Hunting Law.

Distribution. Breeding: probably still breeding at Albanian coastal wetlands.

Wintering and migration: all along the Adriatic coast and at a few inland wetlands.

Key sites. Breeding: formerly in Kune and Vain marshes and in Velipoja marshes; today probably along the Bojana river (unprotected).

Wintering and migration: Lake Skadar (Skodra), Drin delta and Prespa lakes.

% of population included in protected areas. *Breeding:* none.
Wintering: <5%.

Conservation efforts. None.

Research. See Whistler (1936), Lamani (1989), Gjicknuri and Peja (1992), Hagemeyer (1994) and Vangeluwe *et al.* (in press).

* **Bulgaria**

Red Data Book. Listed as Threatened (Anon. 1985).

Legislation. Protected by law since 1962. The species is listed in Act 342/2104.86 of the Ministry of Environment (fine of US\$2.20 for damaging birds or eggs). A fine of US\$460 for any killed bird is planned together with an additional penalty.

Distribution. *Breeding:* areas along the Danube river, areas along the Black Sea coast and a few inland sites such as Kaiadjik and Maritza rivers.

Wintering and migration: Black Sea coast area and Danube river.

Key sites. *Breeding:* Burgas area, Belene Marshes Nature Reserve, banks and islands of Maritza river, Srebarna Nature Reserve.

Wintering and migration: lakes in Burgas area, Lakes Durankulak and Varna, Ovcharitza and Rozov reservoirs, Danube and Maritza rivers.

% of population included in protected areas. *Breeding:* 56–61%.
Wintering: 20–30%.

Conservation efforts.

- Protected area designated for the conservation of Pygmy Cormorants in winter (e.g. no hunting).
- A poster calling for the preservation of the Pygmy Cormorant produced by BSPB.
- Update of the Act protecting the species and increase of fine from US\$2.20 to US\$445 per specimen killed.
- National Wetlands Plan including priority actions for the conservation of the most important wetlands in Bulgaria prepared in 1993 (Ministry of Environment and BSPB).
- Preparation of management plans for several important wetlands (Ministry of Environment and BSPB).

Research. See Anon. (1985), Nankinov (1989) and Simeonov *et al.* (1990).

* **Greece**

Red Data Book. Included as endangered, category 2 (“The danger they face is not immediate for the present”) (Handrinos 1992).

Legislation. Declared as “species of high protection” (Decision of Ministry of Agriculture, 414985/1985). Hunting is thus forbidden.

Distribution. *Breeding:* northern Greece (breeds regularly at Prespa, Petron and Kerkini, irregularly at Porto-Lago, Kastoria, Axios and Ismaris).

Wintering and migration: northern and south-west Greece (Kalamas delta and Kastoria lake).

Key sites. *Breeding:* Lakes Prespa and Kerkini (Ramsar sites).

Wintering and migration: Lake Kerkini, Porto-Lagos area, Nestos, Evros and Axios deltas (Ramsar sites).

% of population included in protected areas. *Breeding:* 90%.

Wintering: 90%.

Conservation efforts. None.

Research.

- Major research project at Kerkini by T. Nazirides (University of Thessaloniki, dissertation in preparation).
- See also Jerrentrup *et al.* (1988), *Pyrovetsi and Crivelli* (1988), *Handrinos* (1993), *Crivelli et al.* (1995a,b), *Catsadorakis et al.* (in press) and Nazirides and Papageorgiou (in press).

* **Former Yugoslavian Republic of Macedonia**

Legislation. Not known.

Distribution. *Breeding:* none.

Wintering and migration: Lake Ohrid, Vardar river, Lake Doiran, Bitola fish-ponds.

Key sites. *Breeding:* none.

Foraging: Lake Megali Prespa (unprotected).

Wintering and migration: Lake Megali Prespa (unprotected), Ohrid (unprotected), Lake Doiran (unprotected), Bitola fish-ponds (unprotected).

% of population included in protected areas. *Breeding:* none.

Wintering: none.

Conservation efforts. None.

Research. None.

* **Moldova**

Red Data Book. Listed as Vulnerable in the Red Data Book of former U.S.S.R. (Borodin 1984).

Legislation. Not known.

Distribution. *Breeding:* Moldova.

Wintering and migration: none.

Key sites. *Breeding:* Danube area.

Wintering and migration: none.

% of population included in protected areas. *Breeding:* not known.

Wintering: none.

Conservation efforts. None.

Research. Not known.

* **Romania**

Legislation. Laws concerning the Biosphere Reserve of the Danube delta.

Distribution. *Breeding:* Danube delta and Danube river.

Wintering and migration: Danube delta.

Key sites. *Breeding:* Bondar, Obrelin Mic, Clinova, Purcelu and Braila (Biosphere Reserve).

Wintering and migration: Danube delta.

% of population included in protected areas. *Breeding:* 100%.

Wintering: 20–40%.

Conservation efforts. Unknown.

Research.

- Monitoring of the breeding colony (M. Marinov).
- See also Paspaleva *et al.* (1985), Anon. (1992) and annual reports of the Danube Delta Institute.

* **Russian Federation**

Red Data Book. Listed as Vulnerable in the Red Data Book of former U.S.S.R. (Borodin 1984).

Legislation. Unknown.

Distribution. *Breeding:* Russian Federation.
Wintering and migration: Caspian Sea coast.

Key sites. *Breeding:* Terek delta.
Wintering and migration: not known.

% of population included in protected areas. *Breeding:* not known.
Wintering: not known.

Conservation efforts. Unknown.

Research. See Sapetin (1968) and Bondarev (1975).

* **Turkey**

Red Data Book. Listed as Vulnerable in the Draft List of Threatened Animals of Turkey (Ministry of Environment).

Legislation. Protected by law since 1975.

Distribution. *Breeding:* mainly central Anatolia.
Wintering and migration: mainly at coastal wetlands.

Key sites. *Breeding:* Eregli marshes, Sultan marshes (National Park), Lakes Uluabat, Aksehir and Eber.

Wintering and migration: Goksu, Büyük Menderes (National Park) and Meric deltas, Sultan marshes, Lakes Uluabat, Bafa and Isikli, and Camalti Tuzlasi (Nature Reserve).

% of population included in protected areas. *Breeding:* <20%.
Wintering: <60%.

Conservation efforts. None.

Research. See Géroudé (1977) and Kasperek (1992).

* **Ukraine**

Red Data Book. Listed as Vulnerable in the Red Data Book of former U.S.S.R. (Borodin 1984).

Legislation. Unknown.

Distribution. *Breeding:* Ukraine.
Wintering and migration: none.

Key sites. *Breeding:* Dnestr delta and Oysul lagoon in Crimea.
Wintering and migration: none.

% of population included in protected areas. *Breeding:* not known.
Wintering: none.

Conservation efforts. Unknown.

Research. See Buzun and Grinchenko (1991).

* **Federal Republic of Yugoslavia (Serbia only)**

Distribution. *Breeding:* in Vojvodina and in Lake Sasko and along the Bojana river (Montenegro).

Wintering and migration: Montenegro.

Key sites. *Breeding:* Bojana river and Obedska Bara marshes (unprotected).

Wintering and migration: Lake Skadar (National Park).

% of population included in protected areas. *Breeding:* none.

Wintering: 60%.

Conservation efforts. None.

Research. See Boswall and Dawson (1975), Vizi (1979) and Soti *et al.* (1981).

PART 2. AIM AND OBJECTIVES

AIM

1. *In the short term to prevent any further declines below 1994 levels in the population size and distribution of the Pygmy Cormorant.*
2. *In the medium to long term to increase the population size of the Pygmy Cormorant to a level at which it no longer qualifies as Near-Threatened.*

OBJECTIVES

1. POLICY AND LEGISLATIVE

- 1.1. *Promote policies at international level which benefit the Pygmy Cormorant*

1.1.1. Promote the maximum protection of the Pygmy Cormorant and its habitat through international conventions

The Barcelona Convention should seek to include all Pygmy Cormorant colonies in the Mediterranean as SPAs.

National strategies drawn up under the Biodiversity Convention should promote the conservation and sustainable management of coastal and inland wetland ecosystems.

Priority: medium

Time-scale: medium

1.1.2. Encourage international policies and legislation which promote the conservation of suitable wetlands within the Pygmy Cormorant's range

The Ramsar Convention, MEDWET programme, EU and other international aid and subsidy programmes have a role to play along with international policies and legislation on agriculture, transport, tourism, etc. International cooperation and exchange of information should be encouraged.

Priority: medium

Time-scale: medium

1.2. Encourage policies at national and regional (within-country) level which benefit the Pygmy Cormorant

1.2.1 Promote the development and implementation of a national action plan for the Pygmy Cormorant

All range states should be encouraged to address in more detail the actions highlighted in this action plan including identifying organisations which will be responsible for implementing each action.

Priority: high

Time-scale: short

1.2.2. Promote the development and implementation of a national action plan for the conservation of wetlands

All range states should be encouraged to set clear targets and priorities for the protection and integrated management of wetlands important for the Pygmy Cormorant and other species. Adjustments needed in national policies and legislation on water, agriculture, tourism, etc. can be identified through this process. The habitat conservation strategies for coastal and inland wetlands, to be published by BirdLife International in 1996 will provide a framework for detailed action plans at national level.

Priority: high

Time-scale: short

1.2.3. Promote full protection of key sites

National policies and legislation should promote the protection of sites important for the Pygmy Cormorant.

Priority: essential

Time-scale: short

1.2.4. Promote hunting legislation

Legal protection for the Pygmy Cormorant should be encouraged in all range-states (breeding or wintering).

Priority: essential

Time-scale: short

1.2.5. Promote non-intrusion zones around breeding colonies

All breeding range states should be encouraged to ensure that the appropriate legislation exists to allow for the enforcement of statutory permanent or temporary non-intrusion zones around breeding colonies, excluding all human access (including fishermen, birdwatchers and photographers). Scientists should be allowed to visit colonies only with permission of the appropriate national body.

Priority: essential

Time-scale: short

2. SPECIES AND HABITAT PROTECTION

2.1. Seek protected area designation for all sites important for Pygmy Cormorant

Sites important for Pygmy Cormorant should be effectively protected from damage or loss through drainage, land reclamation, water extraction, pollution and other damaging developments. Riparian forests, particularly those already known to be used by Pygmy Cormorant, should be given priority when planning the designation of new protected areas. Heronries should also be protected as they play an important role in attracting Pygmy Cormorants to breed.

Priority: essential

Time-scale: short

2.2. Promote the enforcement of legislation and prevent disturbance

It is recommended that a ban on hunting should be implemented in all areas where Pygmy Cormorants winter in large numbers (>100). Adequate levels of wardening will be needed to ensure that hunting controls in wintering areas and protection of breeding colonies are effective. Hunting controls should also be widely publicised (see 4.1.).

Priority: essential

Time-scale: short/ongoing

2.3. Promote appropriate management of wetlands important for the Pygmy Cormorant

2.3.1. Enhance proper management of vegetation in breeding areas

Tree cutting in breeding areas should be avoided.

Priority: essential

Time-scale: short/ongoing

2.3.2. Promote proper water management of wetlands

Favour the creation of shallow waters to improve feeding areas for Pygmy Cormorant. Pollution and drainage should be prevented.

Priority: essential/high

Time-scale: ongoing

3. MONITORING AND RESEARCH

3.1. Monitor numbers at breeding and wintering sites

The number of breeding pairs should be monitored annually (by qualified people only; when a colony is located in reedbeds, the arrival-departure method should be used during the incubation period). Wintering birds should be counted in mid-January each year.

Priority: essential

Time-scale: ongoing

3.2. Monitor water-level and water quality of key Pygmy Cormorant wetlands

Priority: essential

Time-scale: ongoing

3.3. Monitor ecological change at key Pygmy Cormorant wetlands

This can be done by computer-aided techniques like geographical information systems.

Priority: medium

Time-scale: ongoing

3.4. Undertake studies on dispersal, winter movements and the origins of nesting birds

Priority: high

Time-scale: ongoing

3.5. Study feeding ecology

Undertake studies on feeding ecology and fishery catches, especially in relation to potential conflicts between Pygmy Cormorants and commercial fishermen, and assess the impact of the birds on the fish community.

Priority: high

Time-scale: short

3.6. Study interspecific relationships

Undertake studies of the relationships between Pygmy Cormorants and other colonial waterbirds in breeding and feeding areas.

Priority: medium

Time-scale: medium

4. PUBLIC AWARENESS AND TRAINING

4.1. Raise public awareness of the importance of Pygmy Cormorant and its habitat

Undertake public awareness campaigns at all key sites, targeted mainly at hunters, fishermen and local communities as well as civil servants responsible for Pygmy Cormorant conservation.

Priority: high

Time-scale: short/ongoing

4.2. Promote training for those involved in the management and protection of Pygmy Cormorant sites

Promote training courses on wetland issues and provide training for the trainers.

Priority: medium

Priority: ongoing

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ANNEX 1. RECOMMENDED CONSERVATION ACTIONS BY COUNTRY

* **Albania**

- 1.2.5./2.2. Promote the establishment of a non-intrusion zone around all the colonies during the breeding period.
- 2.1/2.3.1. Prevent tree-cutting in the existing breeding colonies.
- 3.1. Undertake yearly surveys of the breeding colonies and midwinter counts.
- 3.3. Monitor ecological change at key sites.
- 3.4. Undertake a ringing programme.
- 3.5. Carry out studies on the feeding ecology in the breeding areas.
- 4.1. Undertake public awareness campaigns and training at all key sites, targeted mainly at hunters, fishermen and local communities.

* **Bulgaria**

- 1.2.2. Encourage the implementation of the National Action Plan for Conservation of the Wetlands (1993).
- 1.2.4./2.2. Promote strong control on hunting and wardening at all sites where Pygmy Cormorants winter and migrate in large numbers, especially Ovcharitza and Rozov reservoirs and Lakes Durankulak, Varna, Atanasovo, Burgas and Mandra.
- 1.2.5./2.2. Promote the establishment of temporary non-intrusion zones around breeding colonies of the Pygmy Cormorant
- 2.2. Careful consideration will have to be given to the risk to Pygmy Cormorants from potential control measures for Cormorants *P. carbo*. Any damage to the Pygmy Cormorant and its habitat should be avoided.
- 2.2. Promote the preservation of the feeding grounds and their fish populations, especially around the breeding colonies.
- 2.2. Reduce pollution in the wetlands around the Burgas area.
- 2.3.2. Encourage the restoration of the hydrological regime of the Srebarna and Belene Reserves.
- 3.1. Undertake surveys of the breeding colonies and midwinter counts.
- 3.3. Monitor ecological change at key sites.

- 3.5. Undertake studies on feeding ecology, especially in the light of potential conflicts between Cormorants (*P. carbo* and Pygmy Cormorant) and commercial fishermen, and assess the impact of the birds on the fish community. This study could provide additional information for the public awareness campaign (see 4.1).
- 4.1. Undertake public awareness campaigns and training at all key sites, targeted mainly at hunters, fishermen and local communities.
- 4.2. Produce educational materials on the species.

* **Greece**

- 2.2. Enhance the enforcement of existing hunting regulations.
- 1.2.2. Encourage the implementation of the Action Plan for the Conservation and Management for Greek Wetlands (1989).
- 1.2.2./2.3.1./
2.3.2. Restore freshwater marshes.
- 1.2.5./2.2. Encourage the establishment of a non-intrusion zone (at least 50 m) around all colonies during the breeding period.
- 2.3.1./
2.3.2. Recommended management at Lake Ismaris: prevent saltwater intrusion and restore the reedbeds and freshwater marshes.
- 2.3.1./2.3.2./
2.2. Recommended management at Lake Kerkini: (1) find practical alternatives to the planned construction of new dikes; (2) lower the present maximum water-level to 35 m a.s.l. by solving the sediment problem (Psilovikos 1992) through finding new sources of water for agriculture and improving the efficiency of the irrigation network (Bartzoudis and Pyrovetsi 1994); (3) enforce and implement the ban on hunting; (4) enforce the ban on cutting the riparian forest.
- 2.3.1./
2.3.2. Recommended management at Lake Prespa: (1) ensure the maintenance of an April–June water-level of at least 854.6 m a.s.l. favouring spawning of fish and producing shallow-water feeding areas; careful thought should be given to making a new link between Mikri and Megali Prespa including a strict management plan for the use of the new sluice in order to ensure a high water-level in spring; (2) manage the reedbeds and restore the wet meadows.
- 3.1. Census the breeding colonies in Lakes Prespa, Kerkini, Petron and Kastoria, and carry out midwinter counts.
- 3.3. Monitor ecological change at key sites.

- 3.4. Undertake a ringing programme.
- 3.5. Undertake studies on feeding ecology, especially in the light of potential conflicts between Pygmy Cormorants and commercial fishermen, and assess the impact of the birds on the fish community.
- 4.1. Undertake public awareness campaigns and training at all key sites, targeted mainly at hunters, fishermen, local communities and civil servants.
- 4.2. Produce educational materials on the species.

* **Former Yugoslav Republic of Macedonia**

- 1.2.5./
- 2.2. Promote the establishment of a non-intrusion zone around all colonies during the breeding period.
- 3.1. Undertake surveys of the breeding colonies and midwinter counts.
- 3.3. Monitor ecological change at key sites.
- 3.4. Undertake a ringing programme.
- 3.5. Carry out studies on feeding ecology in the breeding areas.
- 4.1. Undertake public awareness campaigns and training at all key sites, targeted mainly at hunters, fishermen and local communities.

* **Moldova**

- 1.2.5./
- 2.2. Promote the establishment of a non-intrusion zone around all colonies during the breeding period.
- 2.3.2. Oppose drainage and water extraction and/or water diversion at wetlands.
- 3.1. Undertake surveys of the breeding colonies and midwinter counts.
- 3.3. Monitor habitat changes at key sites.
- 3.4. Monitor movements of ringed birds.
- 3.5. Undertake studies on feeding ecology, especially in the light of potential conflicts between Pygmy Cormorants and commercial fishermen, and assess the impact of the birds on the fish community.

- 4.1. Undertake public awareness campaigns and training at all key sites, targeted mainly at hunters, fishermen and local communities.

* **Romania**

1.2.5./

- 2.2. Promote the establishment of a non-intrusion zone around all colonies during the breeding period.
- 2.3. Encourage the restoration of the floodplains within the Danube delta by partial or total destruction of the dikes along the canals.
- 3.1. Undertake surveys of breeding colonies and midwinter counts.
- 3.3. Monitor ecological change at key sites.
- 3.4. Undertake a ringing programme.
- 3.5. Undertake studies on feeding ecology, especially in the light of potential conflicts between Pygmy Cormorants and commercial fishermen, and assess the impact of the birds on the fish community.
- 4.1. Undertake public awareness campaigns and training at all key sites, targeted mainly at hunters, fishermen and local communities.

* **Russian Federation**

1.2.5./

- 2.2. Promote the establishment of a non-intrusion zone around all colonies during the breeding period.
- 2.3.2. Oppose drainage and water extraction and/or water diversion at wetlands.
- 3.1. Undertake surveys of breeding colonies and midwinter counts.
- 3.3. Monitor habitat changes at key sites.
- 3.4. Monitor the movements of ringed birds.
- 3.5. Undertake studies on feeding ecology, especially in the light of potential conflicts between Pygmy Cormorants and commercial fishermen, and assess the impact of the birds on the fish community.
- 4.1. Undertake public awareness campaigns and training at all key sites, targeted mainly at hunters, fishermen and local communities.

* **Turkey**

- 1.2. Promote the preparation and publication of a Red Data Book for Turkey.
- 1.2.4./2.2./
- 4.1. Improve and publicise the hunting legislation and secure better enforcement.
- 2.1. Encourage the designation of protected areas (breeding and wintering areas) for the species.
- 2.2. Increase wardening at the breeding colonies.
- 2.3.1./
- 2.3.2. Improve the water management of each wetland and secure the minimum habitat requirements for the survival of the Pygmy Cormorant.
- 2.3.2. Prevent wetland drainage and water extraction and/or water diversion, etc.
- 2.3.2. Encourage the necessary measures to prevent pollution throughout the catchment areas of wetlands.
- 3.1. Undertake surveys of the breeding colonies and midwinter counts.
- 3.3. Monitor ecological change at key sites.
- 3.4. Undertake a ringing programme.
- 3.5. Undertake studies of feeding ecology, especially in the light of potential conflicts between Pygmy Cormorants and commercial fishermen, and assess the impact of the birds on the fish community.
- 4.1. Undertake public awareness campaigns and training at all key sites, targeted mainly at hunters, fishermen and local communities.

* **Ukraine**

- 1.2.5./
- 2.2. Promote the establishment of a non-intrusion zone around all colonies during the breeding period.
- 2.3.2. Prevent drainage and water extraction and/or water diversion at wetlands.
- 3.1. Undertake surveys of breeding colonies and midwinter counts.
- 3.3. Monitor habitat changes at key sites.
- 3.4. Monitor the movements of ringed birds.

- 3.5 Undertake studies of feeding ecology, especially in the light of potential conflicts between Pygmy Cormorants and commercial fishermen, and assess the impact of the birds on the fish community.
- 4.1 Undertake public awareness campaigns and training at all key sites, targeted mainly at hunters, fishermen and local communities.